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# Outdoors in georgia

October, 1973





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FRONT COVER: Gray Squirrel. Pen and ink sketch by Liz Carmichael Jones.

BACK COVER: Fall colors at Anna Ruby Falls. Photo by H. E. (Bud) Van Orden.

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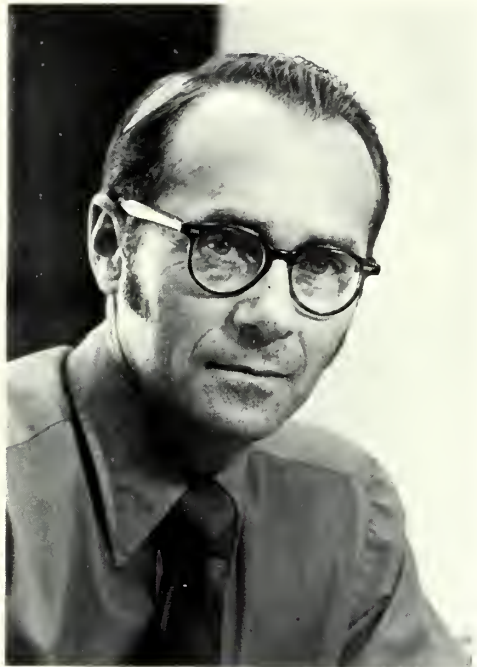
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## *An Outdoorsman for All Seasons....*

Seasons come and seasons go but there is no clear cut definitive time when the sportsman should stop fishing and start hunting, or stop hunting and start fishing. Oh, there are set dates in the regulations that tell us when we can and when we can't all right, but the real outdoorsman is the one who enjoys a little of both, as long as both are in season.

Deer hunting season for firearms hunters officially opens October 20th in Game Zone VI and on November 3rd in Zones I-V and by then practically all sportsmen will be gripped by hunting fever, that is, all except the real sportsmen.

You see, through most of October and into

November comes one of the best periods of fishing for largemouth bass, crappie and bream in middle and southern Georgia, not to mention the peak of the salt water fishing season. So, why not do a little fishing during hunting season?

Sure, the summer months are over, but have you ever camped out in the North Georgia mountains in the fall when the leaves are bursting into brilliant rainbow colored patches spreading across the mountains in unending beauty?

What's best in one season might even be better during another, and you can find out if you're really an "outdoorsman for all seasons."

*Dud Van Orden*



# Wildlife Profiles:

# Squirrels

By Aaron Pass

Art by Liz Carmichael Jones

Probably no form of wildlife is better known to more people than the familiar gray squirrel of city parks and suburban backyards. While it may seem to stretch the point to classify this bandit of townhouse bird feeders as wildlife, it is genetically the same animal as any squirrel from the deepest river swamp or most remote mountain wilderness.

The gray squirrel (*Sciurus carolinensis*) has a statewide distribution, and there is virtually no area of suitable habitat that does not harbor some resident grays. The fox squirrel (*Sciurus niger*) occupies a more restricted range in the piney woods of south central Georgia. These two species are the largest and best known of the tree squirrels in the state. The diminutive red squirrel or chickaree (*Sciurus hudsonicus*) occurs on a very restricted area in extreme northeast Georgia, and the flying squirrel (*Glaucomys volans*), while both numerous and widespread, is nocturnal and is seldom seen. Thus the word "squirrel" normally conjures up the image of the ubiquitous gray or colorful fox squirrel.

Squirrel populations seem to be increasing in direct proportion to the increasing areas of suitable habitat.

The rural-to-urban population shift and the decline of farming have resulted in an increase in total forest acres in the state. The adaptable squirrel has lost no time in capitalizing on this expansion of habitat.

Living quarters for the squirrel tribe consist of two main types. Hollow den trees furnish the necessary protection during the winter months and often the first litters of the season are born there in early spring. In the summer, squirrels construct cool leaf nests which are often little more than wads of leaves stuffed into the fork of a branch. Some leaf nests are more elaborate, with an opening leading to an interior compartment. This type of nest is often used during mild winter weather in the south.

As are all wild animals, squirrels are afflicted by parasites, but do not seem to suffer greatly from them. It is very common for a squirrel to host fleas and/or ticks and be in perfect health otherwise. Mange, or scabies, is caused by a skin mite and seems to become more prevalent during periods of stress, such as late winter, when the squirrel is in a weakened condition. The most controversial squirrel parasite is the larvae of the botfly, commonly called warbles or "wolves". The larva burrows under the animal's skin and there develops a large grub. These parasites are unsightly, but in no way affect the squirrel's edibility.

In the way of predators, there is no single species which seems to specialize in predation on squirrels, although most will take a squirrel when opportunity presents. That doesn't happen too often since the squirrel is a skilled acrobat in the treetops and an accomplished runner on the ground. When cornered, the squirrel is no pushover and will bite viciously. Foxes, owls, bobcats and raccoons may all take the occasional squirrel, but none of these is considered a significant predator.

The large broadwinged hawks, such as the redtail and red-shouldered, are perhaps the top squirrel predators. They will wait patiently for an unwary squirrel to appear and pick him off when he ventures along an open branch. The weasel is an effective climber and since he is small enough to enter the den holes and tough enough to cope with whatever he finds there, the weasel may be a significant nest predator.

The squirrel diet is composed principally of the products of hardwood trees. Fruit, or "soft mast" is the mainstay of summer, being replaced by nuts in the fall. The surplus nuts are buried by the squirrels to serve as food caches during the lean months of winter. In the early spring, with stored nuts running low, the squirrels turn again to the hardwoods and feed heavily on the swelling buds. The foregoing diet of the



forest squirrel is by no means exclusive of the farmer's produce when a cornfield is conveniently located near the squirrel woods. Squirrels are not averse to a bit of protein when the opportunity presents itself in the form of grubs, insects or a bird's nest containing eggs or baby birds.

Mating is normally accomplished in late December and early January. Gray squirrels mate indiscriminately, but fox squirrels show a tendency to pair off during the breeding season. The young are usually born in early May, naked and blind. The average litter contains two to four young. The young squirrels usually make their first excursions from the den when they are about six weeks old, and are able to make their own way in the world at about three months.

There are many similarities between gray and fox squirrels in terms of food habits and general appearance. Both species are members of the huge mammalian order, *Rodentia*, the gnawing animals. Squirrels, like all other members of this order, have the characteristic large incisor teeth which are specialized for gnawing. These teeth continue to grow throughout the animal's life and are kept at a manageable length and sharpened by constant wear against the opposing set of teeth. Both species are tree dwellers and exhibit the typical rodent body shape, but with a bushy tail. It is in the specifics of appearance that the two species differ.

The gray squirrel is aptly named for his most dominant color, a silvery gray due to white tips on the hairs. The body and tail of this species are banded in colors of black, gray, brown, and white. The long tail hairs have six distinct color bands ending in white tips. The chest, throat and belly fur is white. Gray squirrels average about 20 inches in overall length with the long flowing tail making up about half.

In habitat the gray is a squirrel of the "big" woods, preferring large stands of mature timber. They seem to have a particular affinity for creeks and branches and concentrate near these areas.

The fox squirrel is larger than the gray, averaging around 25 inches in total length. The coloration of the fox squirrel is extremely variable and may be black, gray or "red". The red refers to a rusty yellow-orange color phase that is normal to fox squirrels. The underparts may be buff or the brighter orange-yellow with the back grizzled with the same rusty cast. A grizzled "salt-and-pepper" phase is also common, as is a solid black phase of the fox squirrel. The best field expedient to differentiate between fox and gray squirrels is the tips of the tail hair. The presence of white tips indicates a gray. When cooked, the bones of gray squirrels are white; fox squirrel bones are pink.

The fox squirrel prefers a more open habitat than the gray. He is most

at home in small wood lots interspersed with open country, or along tree lines which may border a drain or creek between two fields. Because of this the fox squirrel has greater opportunity to sample the farmer's crops which it does with great regularity.

In some respects the squirrel seems a lowly fellow, a vulgar commoner in comparison to the more exotic species of wildlife. Although he is denied the prestige of rarity or the glamour of a remote and restricted habitat, the squirrel has had considerable influence in the heritage and traditions of our nation. For the earliest settlers, squirrels were an abundant source of food. Mountain tradition holds that squirrel broth will break a fever, and, of course, the "mighty oaks from (which) little acorns grow" often owe their existence to the squirrel who buried the acorns. The hillbilly with his squirrel rifle is an enduring cultural heritage from Davy Crockett to Sgt. York.

Even today squirrels are a popular and important game species. Traditionally they are the favorite quarry of small boys with .22's, but it is not unknown for an older hunter to take to the squirrel woods seeking to recapture happy memories of younger days. There are many reasons for the popularity of squirrels as a game species, but perhaps the most important are the abundance and availability of the species.

# Pre-Season Game... For Deer Hunters

By Aaron Pass

Photo by Aaron Pass





There was scarcely a sound in the autumn woods, aside from the slight rustlings that marked my passage down the narrow game trail. Pushing aside branches which could not be stepped around, I tried to move as quietly as possible. Wool pants and jacket would have been ideal for quiet movement, but this early in the season such trappings would also have been unbearably hot.

Careful walking was the order of the day, even through the pines where a thick carpet of needles deadened

much sound. Just at the edge of the pines was my goal, a small hardwood draw with a tiny creek, now down to the barest trickle in the early fall. Stopping just inside the concealing pines, I dared not venture further onto the dry, fallen oak leaves which would make stealth impossible. My stand overlooked the draw, and I knew that those oak leaves would make any movement there audible.

After but a few minutes wait there was a rustling in the leaves from the left, about fifty yards up the draw.

The source of the noise was out of sight, and from all indications, whatever it was had no desire to move my way. The notion of attempting a stalk was appealing but while still wrestling with the temptation, there was another disturbance from the right and much closer. Having turned to face the original noises, I slowly twisted around and glimpsed a quick movement in the brush. Still unaware of my presence, my quarry moved into the open. The rifle came up, the crosshairs steadied, and with the crack of the shot, the gray squirrel pitched forward into the leaves.

Moving quickly so as to give the animal no chance to escape if only wounded, I retrieved a plump gray squirrel taken cleanly by a head shot. Dropping back into the pines, I moved quietly, and as quickly as possible, up the hollow toward the original noise. Selecting another likely looking stand, I soon added another squirrel to the bag, almost undoubtedly the first noisemaker.

Both squirrels were in prime condition and were quite fat from the abundant acorns in the little draw. I field dressed them immediately for flavor's sake and turned homeward. The two squirrels had been the substance of a fine afternoon in the autumn woods, and were soon to be the main ingredients in a squirrel stew (with dumplings), and would eventually lead to some excellent venison.

Yes, V-E-N-I-S-O-N; deer meat—the stuff you get when you butcher a deer. How do two squirrels add up to venison? Well really it's quite simple when you think about the many similarities between deer and squirrel hunting. In fact, the two pursuits are virtually identical aside from the differential in size of the animals, the caliber of weapons used to hunt them, and that squirrels never grow antlers and deer seldom climb trees.

Both deer and squirrel are animals of the forest rather than the open field. Both are often found around oaks, for both species dearly love acorns and white oak acorns in particular. Both are most active early and late in the day. Both can be hunted with either a rifle or a shotgun, and by either stalking or sitting. And finally, both species can be as easy or as difficult to bag as



Photo by Aaron Pass

the hunter cares to make it.

Of course, no analogy is perfect and this one is less so than most. As in the antlerless squirrels and non-climbing deer, there are many habits and traits unique to the individual species. The deer relies mainly on its ears and nose as a defense, having mediocre eyesight. Squirrels, on the other hand, use mainly their ears and eyes for warning of impending danger. There are many other differences of course, but it is the many basic similarities which are important to this article.

If the three opening paragraphs sound much like the beginning of a story about a deer hunt, fine, you've got the point. It is in the areas of basic woodcraft and hunting marksmanship that deer and squirrel hunting are so similar. Unfortunately, it is shortcomings in both of these areas that cost untold numbers of hunters an unbelievable number of missed opportunities at deer each fall. Think for a moment about the deer you saw last

season, and then contemplate the number that you might have seen if you had just been . . . a bit more alert, able to move more quietly, more adept at interpreting what you did see and hear. In the same vein, did you miss your shot last year? If the answer is yes, that pretty well speaks for itself.

Just as it takes a sailor some time out of port to get his sea-legs, the average hunter needs some practice to be able to see, hear, and move quietly in the woods—to get his “woods-legs.” The average hunter is like most everybody else, tied down to a job, family and civic responsibilities with precious little time to do his thing. Senses clogged and deadened by the accumulation of workaday detail, about the only time our average hunter really *has* to walk quietly is when he comes home particularly late from bowling or playing cards. To think that one can suddenly transform himself into a silent wraith in the woods on opening day is just as naive as thinking of one-



self as an immediate replacement for Tommy Nobis, the next time that star linebacker throws a kneecap.

Don't kid yourself that you can sharpen up your woods and hunting skills by taking hikes and going to the range. These are good beginnings but they are a far cry from the real thing. To put on that final edge you must make some real contact with a real opponent, preferably in a situation that resembles a deer hunt as much as possible. For this purpose squirrel hunting can't be beat. If you can pick up and identify the movements of a squirrel in the dense foliage of early autumn, you should have no trouble seeing a deer in November. Anyone who can make a high percentage of shot on a squirrel's head should surely be able to hit a deer adequately. This, plus the fact that decent squirrel hunting is relatively available and that the season opens earlier than does the deer season, makes squirrel hunting an ideal primer for the deer hunter.

It is important that your squirrel hunt duplicate your deer hunt as closely as possible. Statistically more game (both deer and squirrel) falls to those who have the patience to "... also stand and wait." If you are a fiddle-footed type who can't sit still, then by all means stalk your squirrels. There's no better way to learn the rudiments (and the pitfalls) of quiet movement than trying to sneak up on an alert squirrel. If you do this enough you will bag some squirrels and won't sound like a re-enactment of the charge of the Light Brigade in the deer woods.

It is highly advisable to use the same type firearm and sighting apparatus that you use for deer hunting. If your favorite venison-getter is a lever-action carbine with a peep sight, so should be your squirrel gun. The duplication doesn't have to be perfect in terms of weight, length, etc., but the basic action should correspond. It can be quite nerve-racking to attempt pumping another round into a bolt action while watching a big buck bound away.

Other than the rifle, ye compleat squirrel hunter needs relatively little specialized equipment. A good, sharp pocket knife will handle the field dressing (which should be done im-

mediately in warm weather), and a sturdy pair of boots or work shoes is required. Insect repellent will make any hunt more pleasurable, particularly for the sitting hunter. It is extremely difficult to concentrate on hunting under a cloud of mosquitoes. A good dose of sulphur will keep bugs away, but will also alienate friends and family. If you use enough of the stuff, your hunting buddies will probably buy you some commercial bug dope.

As for clothing, any dark colors will get you by; a serviceable camouflage suit costs little and makes a noticeable difference. Real squirrel fanatics sometimes even go to face masks and camouflage gloves. This may seem a bit extreme, but it's hard to argue with success.

Generally speaking, finding a squirrel hunting spot is as simple as finding a stand of oak and hickory trees along a creek or branch. Recent squirrel activity in an area can be determined by reading signs. The presence of a large number of "beds" is an indication of squirrel activity, but does not conclusively prove that squirrels are currently in the area. Many of these leaf nests are constructed as temporary day beds during the summer and are abandoned before hunting season. Incidentally, shooting into these beds is illegal. Unless the aspiring deer hunter sees many deer in these squirrel nests each season, this method of "hunting" is not very useful to him.

The best indication of current squirrel usage is the presence of nut hull cuttings scattered on the ground. Since squirrels prefer a bit of altitude when they eat, look for accumulation of these cut hulls on stumps, rocks, and fallen logs. The more freshly cut, the more recent the activity.

Alertness, knowledge, and stealth are the basic ingredients of the successful hunter. The alertness to notice a movement or sound that is slightly out of phase with the surroundings, the knowledge to interpret what it means, and the stealth to do something about it, are the prime skills of woodcraft. Hunting the gray squirrel will not teach you all about the white-tailed deer, but it will provide a training or refresher course in the fundamentals of hunting.



Photo by Jim Couch

*Georgia's 350,000 acres of saltmarsh provide extensive favorable habitat for the rail with a lot of hunting room.*

# Game Bird Of The Future

By Ron Odom

The clapper rail, sometimes known locally as marsh hen or mud hen, should be considered by Georgia's sportsmen as a bright spot in the future of Georgia's wildlife resources. At a time when urbanization, technology and modern forest management practices — among other things — tend to reduce or eliminate much of our small and big game habitat, the saltmarsh habitat of the marsh hen remains relatively stable. Georgia is blessed with approximately 350,000 acres of salt or brackish marshland, most of which is literally teeming with marsh hens. It cannot be denied that many threats

to the saltmarsh environment do exist, but as yet this resource has not been exposed to the misuse or mismanagement that has characterized much of our mainland habitats.

During the 1800's, accounts given by naturalists, such as Audubon, reflected the amazing abundance of marsh hens. Audubon stated that "it was not unusual for an 'egger' to gather a hundred dozen eggs in one day" and that "as many as 60 birds could be killed in four hours." Though most of these accounts probably referred to the northern clapper rail (*Rallus longirostrus crepitans*), it

is probable that our resident clapper rail (*Rallus longirostris waynei*) was at least as abundant. It is highly probable that many areas still retain populations comparable to those in the 1880's. Wildlife biologists have captured as many as 80 clappers in two hours on the marsh with the aid of an airboat.

Our Georgia clapper rail is actually a subspecies of the northern clapper rail — though differentiation between the two is very difficult if not impossible in the field. The northern species is known to be migratory, arriving in our marshes usually in September and returning to their northern breeding grounds in late March. These movements are verified each fall by Georgia hunters that shoot birds that have been banded in North Atlantic coastal marshes. Just how many of these northern birds use our marshes as wintering grounds is unknown at this time. Research, part of which includes a stepped-up banding program, is underway seeking an answer to this question. Our local populations are generally thought to be non-migratory — though little data exists to verify this assumption.

Food habit studies indicate that the bulk of the clapper's food consists of fiddler crabs, square-back crabs, and periwinkle snails, all of which are very common in the saltmarsh. These primary food items all have a very hard exoskeleton that is not digestible. These unwanted particles must be regurgitated in the form of a pellet. Most feeding occurs at low tide, particularly along the mud flats of tidal creeks and rivers.

Nests, constructed of dead vegetation pushed down into the surrounding grass forming an inverted cone, begin receiving eggs in late April. A canopy is usually constructed over the nest by pulling several blades of grass together to arch over the top of the nest and there usually will be a short runway constructed of matted grass, leading from the edge of the nest to the ground.

Photo by Ron Odom



The medium height cordgrass is preferred for nesting as is the zone lying within 30-40 feet of small drainage creeks.

The average clapper nest will contain eight eggs, though actual numbers range from five to fourteen eggs. It appears that clappers are monogamous with the males assisting the females with both incubation and rearing of the young. Both adults are commonly seen at the nest during incubation and also during brooding of the young downy chicks.

The eggs, about the size of a golf ball, are grey-white in color with rust or brown colored speckling. Incubation lasts from 20 to 24 days with all eggs normally hatching within 24 to 48 hours. Hatching success varies from area to area along the coast. Nest losses are usually due to predation or severe weather.

In South Carolina, studies have shown the raccoon to be responsible for nearly 74% of all mammalian predation. Other predators include minks, crows, humans, hawks and owls. An occasional bird has even shown up in the stomachs of sharks taken offshore. Raccoons probably do the most damage in Georgia since they are so abundant in Coastal marshes. Predation by man, though very widespread in the past, is uncommon or non-existent today.

High tides, accompanied by high northeast winds, destroy many nests along with, on many occasions, large numbers of adult clappers. High water alone does not destroy the eggs since they are able to withstand complete submersion. Wave motions caused by high winds often cause nests to break up. Significant losses of adult birds have been known to occur in many areas after hurricane force storms. Another mortality factor of interest is loss due to accidents during migration. Collisions during bad weather with television towers, buildings, lighthouses, and automobiles all take their toll. Dead chicks are commonly seen by Coastal residents on many of the causeways leading to our Coastal islands.

Even more frightening and threatening, however, are the potential effects of the many forms of pollution flowing into our Coastal marshes. The clapper rail is entirely dependent on the salt marsh for survival and any wholesale destruction of these marshes or of the rails' food supplies will spell out the end of the marsh hen.

Identifying the sexes in the field is a very difficult task, since both male and female look alike. In the northern subspecies, there is a significant difference in size between males and females. Biologists in New Jersey measure length of bill, length of middle toe, and width of bill to determine sex. Generally, males tend to be significantly larger than females — a relationship still to be verified for Georgia rails.

The most popular method of hunting clappers is to pole a small boat, during extremely high tides, across the marsh grass. During these high tides an approaching

*Rails build nests of dead vegetation pushed together to form an inverted cone. The nests contain from five to fourteen eggs, which are incubated by both adults for 20-24 days.*



*The baby rails are especially vulnerable to severe storms and predation by raccoons, minks, crows, hawks, and owls.*

Photo by Ron Odom

boat will cause the hens to flush in front of the “gunner” who is positioned in front of the boat. It is only during these very high tides that hunting is feasible, since rails strongly prefer to run, if possible, rather than fly and usually fly only as a last resort. Many times they will even revert to swimming rather than flying and surprisingly enough, they swim very well.

Other people prefer to do their hunting on a dead low tide. On the low tides marsh hens often come to the water's edge to feed on the exposed mud flats. Drifting quietly along tidal creeks during low water can be very productive at times and is certainly less exhausting.

A method that is increasing in popularity is that of using a dog to flush birds. Some marshes along the coast have a firm enough bottom and short enough grass to make this method both enjoyable and productive. The use of dogs has become quite popular in some of the salt meadows of the North Atlantic states; however, most of our state's salt marsh is extremely difficult, if not impossible, to walk on.

In past years hunters hired a local “poler” to do most of the work as well as to guide. “Polers” today are becoming scarce in Georgia and many of our modern-day sportsmen frown at the task of poling a boat through the marsh. Other states to the north have an adequate supply of guides and as a result feel their clapper harvest is at the maximum allowable level. Considerable controversy has developed about the enactment of a law, prior to the opening of the 1948 season, prohibiting the shooting of clapper rail from a power driven boat. Without the added luxury of an outboard, most hunters feel that clapper hunting is not worth the effort. It is probable,

however, that we'll see a change in this attitude in future years.

Currently there is an effort underway to step up research on all species of rails. Georgia has initiated a banding program on the coast that will continue for another three years. Hopefully, through this program we can gather additional information on movements, mortality, brood survival, and banding techniques, in order to insure intelligent management of this resource in the future.

New Jersey has led the way in clapper banding and has also made great strides in census techniques. Other states have completed life history studies. What is needed now is a co-operative regional effort, including all of the “clapper” states, to focus more attention on this species. Of primary importance is the need for additional banding data. Other basic needs are:

- 1) Preservation of habitat — marsh hens are restricted to the coastal salt marshes. Any unnecessary filling or draining of our marshes will eliminate a certain portion of our clapper resource.
- 2) Pollution abatement — pollution running into our marshes, if not directly affecting the birds themselves, could contaminate their principal food sources, the fiddler crabs, squareback crabs and periwinkle snail. When these food sources go, so do our rails. (**See Outdoor World, page 30, for latest information on current pollution problems.**)
- 3) Research — if we are to use this resource wisely, we must increase our knowledge about the birds. This would include additional banding data, sexing



*The rail held here by Ron Odom may be suffering from mercury poisoning found to be affecting some rails in the Brunswick area north of the Sidney Lanier Bridge. Rails from this area are not fit for human consumption.*

and aging techniques, census procedures, and habitat inventories.

If you've never tried hunting clappers, don't sell them short. You'll sweat a little and probably get your gun a little rusty, maybe the birds won't be as sporting as you are used to; but if you'll make an effort to enjoy the total hunting effort and not just bagging the birds, you'll have another excuse to head for the field next fall. The rail birds are numerous, the weather usually is balmy, scenery fantastic, and you have about 300,000 unspoiled acres on which to hunt at your leisure.

For equipment, all that is needed is a light two-man duck boat or aluminum pram, and any gauge shotgun that is suitable for dove or quail will do, using light loads of number 8 shot. It is unlike any other kind of hunting you've ever tried!

This year's season began on September 10 and will end November 18. Best rail hunting tides are shown in the table opposite. The Game and Fish Division can provide information on best areas to hunt.

If you've never hunted the clapper — why not pick a high tide and give them a try. You may be pleasantly surprised.



Times given are Eastern Standard—adjust for Daylight Saving by adding one hour.

Calculations are for Savannah River Entrance. Corrections for other locations can be made by using the accompanying tidal difference data. Merely add or subtract the correction as indicated for the specific location.

|                                             |                                | DIFFERENCES<br>Time |              |
|---------------------------------------------|--------------------------------|---------------------|--------------|
| GEORGIA                                     |                                | High<br>Water       | Low<br>Water |
| <b>Savannah River</b>                       |                                |                     |              |
| 2707                                        | Tybee Light . . . . .          | -0 08               | -0 15        |
| 2715                                        | Port Wentworth . . . . .       | +0 33               | +0 41        |
| <b>Tybee Creek and<br/>Wassaw Sound</b>     |                                |                     |              |
| 2719                                        | Tybee Creek entrance . . .     | -0 07               | +0 02        |
| 2727                                        | Thunderbolt . . . . .          | +0 34               | +0 09        |
| 2731                                        | Isle of Hope, Skidaway River   | +0 52               | +0 25        |
| <b>Ossabaw Sound</b>                        |                                |                     |              |
| 2733                                        | Egg Islands . . . . .          | +0 06               | +0 07        |
| 2739                                        | Fort McAllister, Ogeechee R.   | +0 50               | +1 13        |
| 2743                                        | Cane Patch Creek entrance .    | +0 57               | +0 40        |
| <b>St. Catherines and<br/>Sapelo Sounds</b> |                                |                     |              |
| 2747                                        | Kilkenny Club, Kilkenny Cr. .  | +0 31               | +0 13        |
| 2749                                        | Sunbury, Medway River . . .    | +0 56               | +0 42        |
| 2757                                        | Blackbeard Island . . . . .    | +0 20               | +0 19        |
| 2761                                        | Mud R., at Old Teakettle Cr. . | +0 47               | +0 43        |

|                         |                                | DIFFERENCES<br>Time |              |
|-------------------------|--------------------------------|---------------------|--------------|
| Doboy and Altamaha      |                                | High<br>Water       | Low<br>Water |
| <b>Sounds</b>           |                                |                     |              |
| 2762                    | Blackbeard Cr., Blackbeard I.  | +0 21               | +0 44        |
| 2763                    | Sapelo Island . . . . .        | 0 00                | +0 02        |
| 2769                    | Darien, Darien River. . . .    | +1 10               | +1 12        |
| 2771                    | Wolf Island . . . . .          | +0 06               | +0 35        |
| 2773                    | Champney I., S. Altamaha R.    | +1 12               | +2 30        |
| <b>St. Simons Sound</b> |                                |                     |              |
| 2779                    | St. Simons Sound bar . . . .   | +0 01               | -0 05        |
| 2781                    | St. Simons Light . . . . .     | +0 24               | +0 28        |
| 2785                    | Troup Cr. entr., Mackay R. .   | +0 54               | +0 49        |
| 2787                    | Brunswick, East River . . .    | +0 55               | +0 40        |
| <b>St. Andrew Sound</b> |                                |                     |              |
| 2797                    | Jekyll Point . . . . .         | +0 28               | +0 28        |
| 2799                    | Jointer Island, Jointer Creek  | +1 02               | +0 49        |
| 2807                    | Dover Bluff, Dover Creek . .   | +0 57               | +0 49        |
| 2817                    | Cumberland Wh., Cumb. R. .     | +0 40               | +0 42        |
| <b>Cumberland Sound</b> |                                |                     |              |
| 2821                    | St. Marys Entr., north jetty . | +0 15               | +0 15        |
| 2823                    | Crooked River entrance . . .   | +1 23               | +1 12        |
| 2825                    | Harrietts Bluff, Crooked River | +2 09               | +2 12        |
| 2827                    | St. Marys, St. Marys River. .  | +1 21               | +1 13        |

# OCTOBER, 1973

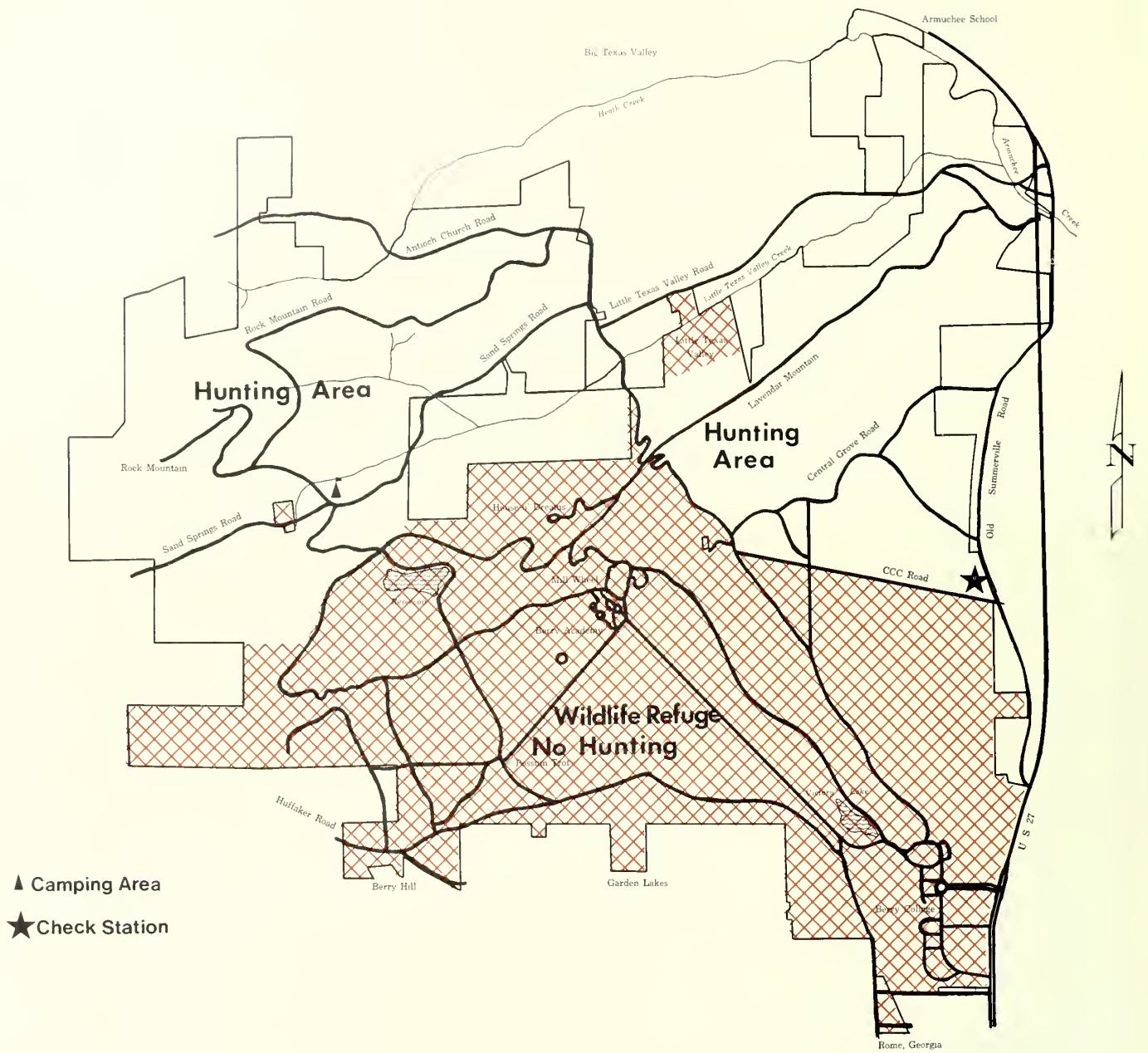
| Doy     | A.M.  | High Water |       | Ht. | Low Water |       |
|---------|-------|------------|-------|-----|-----------|-------|
|         |       | Ht.        | P.M.  |     | A.M.      | P.M.  |
| 1 Mon.  | 11:00 | 7.4        | 11:04 | 6.5 | 4:44      | 5:23  |
| 2 Tue.  | 11:45 | 7.0        | 11:53 | 6.2 | 5:27      | 6:11  |
| 3 Wed.  | —     | —          | 12:35 | 6.8 | 6:14      | 7:04  |
| 4 Thu.  | 12:44 | 6.0        | 1:28  | 6.6 | 7:09      | 8:05  |
| 5 Fri.  | 1:41  | 6.0        | 2:24  | 6.6 | 8:12      | 9:05  |
| 6 Sat.  | 2:39  | 6.1        | 3:26  | 6.7 | 9:14      | 9:56  |
| 7 Sun.  | 3:42  | 6.3        | 4:21  | 6.9 | 10:07     | 10:43 |
| 8 Mon.  | 4:38  | 6.8        | 5:12  | 7.2 | 10:58     | 11:28 |
| 9 Tue.  | 5:27  | 7.3        | 5:55  | 7.4 | 11:48     | —     |
| 10 Wed. | 6:13  | 7.8        | 6:36  | 7.6 | 12:10     | 12:32 |
| 11 Thu. | 6:55  | 8.3        | 7:16  | 7.7 | 12:52     | 1:17  |
| 12 Fri. | 7:34  | 8.6        | 7:53  | 7.7 | 1:34      | 2:02  |
| 13 Sat. | 8:17  | 8.8        | 8:34  | 7.6 | 2:17      | 2:48  |
| 14 Sun. | 9:02  | 8.8        | 9:20  | 7.4 | 3:01      | 3:34  |
| 15 Mon. | 9:51  | 8.6        | 10:11 | 7.1 | 3:46      | 4:22  |
| 16 Tue. | 10:44 | 8.3        | 11:08 | 6.8 | 4:36      | 5:17  |
| 17 Wed. | 11:45 | 8.0        | —     | —   | 5:33      | 6:17  |
| 18 Thu. | 12:15 | 6.6        | 12:51 | 7.7 | 6:36      | 7:25  |
| 19 Fri. | 1:25  | 6.6        | 2:01  | 7.5 | 7:47      | 8:35  |
| 20 Sat. | 2:39  | 6.7        | 3:07  | 7.5 | 9:00      | 9:38  |
| 21 Sun. | 3:52  | 7.1        | 4:16  | 7.5 | 10:03     | 10:33 |
| 22 Mon. | 4:56  | 7.6        | 5:15  | 7.6 | 10:58     | 11:22 |
| 23 Tue. | 5:51  | 8.0        | 6:04  | 7.7 | 11:52     | —     |
| 24 Wed. | 6:36  | 8.3        | 6:48  | 7.7 | 12:10     | 12:41 |
| 25 Thu. | 7:17  | 8.5        | 7:29  | 7.6 | 12:54     | 1:27  |
| 26 Fri. | 7:56  | 8.4        | 8:03  | 7.4 | 1:37      | 2:12  |
| 27 Sat. | 8:32  | 8.3        | 8:39  | 7.2 | 2:18      | 2:53  |
| 28 Sun. | 9:10  | 8.0        | 9:15  | 6.9 | 2:56      | 3:33  |
| 29 Mon. | 9:43  | 7.7        | 9:52  | 6.6 | 3:34      | 4:12  |
| 30 Tue. | 10:22 | 7.3        | 10:31 | 6.4 | 4:13      | 4:54  |
| 31 Wed. | 11:05 | 7.0        | 11:16 | 6.2 | 4:54      | 5:36  |

Moon Phases:  
1st Qtr. 4th, Full Moon 12th, Last Qtr. 18th, New Moon 26th

# NOVEMBER, 1973

| Doy     | A.M.  | High Water |       | Ht. | Low Water |       |
|---------|-------|------------|-------|-----|-----------|-------|
|         |       | Ht.        | P.M.  |     | A.M.      | P.M.  |
| 1 Thu.  | 11:52 | 6.8        | —     | —   | 5:37      | 6:27  |
| 2 Fri.  | 12:05 | 6.1        | 12:43 | 6.6 | 6:30      | 7:20  |
| 3 Sat.  | 12:59 | 6.1        | 1:34  | 6.5 | 7:28      | 8:16  |
| 4 Sun.  | 2:00  | 6.2        | 2:30  | 6.5 | 8:29      | 9:10  |
| 5 Mon.  | 2:55  | 6.5        | 3:27  | 6.6 | 9:28      | 10:01 |
| 6 Tue.  | 3:52  | 6.9        | 4:20  | 6.8 | 10:21     | 10:46 |
| 7 Wed.  | 4:48  | 7.4        | 5:13  | 7.0 | 11:12     | 11:30 |
| 8 Thu.  | 5:37  | 8.0        | 6:02  | 7.2 | —         | 12:03 |
| 9 Fri.  | 6:25  | 8.4        | 6:46  | 7.4 | 12:16     | 12:51 |
| 10 Sat. | 7:11  | 8.8        | 7:33  | 7.4 | 1:04      | 1:40  |
| 11 Sun. | 8:00  | 8.9        | 8:20  | 7.4 | 1:52      | 2:29  |
| 12 Mon. | 8:48  | 8.9        | 9:09  | 7.3 | 2:41      | 3:21  |
| 13 Tue. | 9:39  | 8.6        | 10:04 | 7.1 | 3:32      | 4:12  |
| 14 Wed. | 10:36 | 8.3        | 11:04 | 6.8 | 4:25      | 5:07  |
| 15 Thu. | 11:33 | 7.9        | —     | —   | 5:23      | 6:05  |
| 16 Fri. | 12:11 | 6.7        | 12:37 | 7.6 | 6:24      | 7:06  |
| 17 Sat. | 1:19  | 6.7        | 1:41  | 7.3 | 7:34      | 8:10  |
| 18 Sun. | 2:27  | 6.9        | 2:46  | 7.0 | 8:41      | 9:13  |
| 19 Mon. | 3:36  | 7.1        | 3:49  | 6.9 | 9:45      | 10:04 |
| 20 Tue. | 4:33  | 7.4        | 4:45  | 6.9 | 10:40     | 10:55 |
| 21 Wed. | 5:28  | 7.7        | 5:38  | 6.9 | 11:31     | 11:41 |
| 22 Thu. | 6:14  | 7.9        | 6:23  | 6.9 | —         | 12:20 |
| 23 Fri. | 6:57  | 8.0        | 7:02  | 6.8 | 12:26     | 1:05  |
| 24 Sat. | 7:34  | 7.9        | 7:40  | 6.8 | 1:09      | 1:47  |
| 25 Sun. | 8:10  | 7.8        | 8:14  | 6.6 | 1:50      | 2:29  |
| 26 Mon. | 8:44  | 7.6        | 8:50  | 6.5 | 2:30      | 3:11  |
| 27 Tue. | 9:18  | 7.4        | 9:25  | 6.3 | 3:09      | 3:50  |
| 28 Wed. | 9:53  | 7.1        | 10:03 | 6.2 | 3:46      | 4:28  |
| 29 Thu. | 10:32 | 6.9        | 10:48 | 6.1 | 4:25      | 5:07  |
| 30 Fri. | 11:13 | 6.7        | 11:33 | 6.1 | 5:07      | 5:55  |

Moon Phases:  
1st Qtr. 3rd, Full Moon 10th, Last Qtr. 17th, New Moon 24th



# Berry Wildlife Management Area

# EDUCATED DEER AT BERRY COLLEGE

By Aaron Pass

Photos by the Author

Among the ridges and valleys just northwest of Berry College at Rome, Georgia, lies one of the most unique wildlife areas managed by the Game and Fish Division, a combination Management Area and Wildlife Refuge. The Berry College Area combines the concept of a wildlife sanc-





*Area Manager Frank Early of the Game and Fish Division surveys Berry College Wildlife Management Area and Refuge from the clifflike precipice which surrounds the crest of Rocky Mountain.*

tuary with the opportunity for regulated hunting on 25,000 acres of college-owned land in Floyd County. The outer periphery of the tract is managed in the same manner as any state wildlife management area — for increased wildlife values with a carefully planned, regulated harvest of game by public hunting. The core of the area adjacent to the campus is closed to hunting and serves as a wildlife refuge.

Berry College has acquired this tract of property through a long term land acquisition program going back many years. The property has always been used for timber production with the money from timber sales going to support this independent college. Berry's forest management program is scientifically designed to provide for a long term harvest with continual increase in quality and quantity of forest resources. According to Berry officials, "We are concerned with the ecology, and all timber harvests are planned and regulated for environmental value preservation."

A natural progression of awareness and concern has also led to a studied consideration of the wildlife resources in Berry's forest. Following the thought that "... the environment is a real factor in the education process," Berry officials contacted the State Game and Fish Department (now a Division of the Department of Natural Resources) for advice and assistance in effective wildlife management. According to Berry officials, "We were initially interested in a wildlife refuge to benefit wildlife and preserve tranquility."

A thorough field investigation by

Game and Fish biologists found that the Berry forest had abundant wildlife populations, possibly an overabundance of some species: "We found a particularly plentiful deer population on the area, with a high potential for a dangerous overpopulation waiting for the opportunity to happen. The consequences of this would, of course, be habitat damage by the too-numerous animals and ultimately starvation for a large percentage of the population. On this basis we recommended a controlled harvest of the deer population for the benefit of the total ecosystem in the Berry forest," said Bill Collins, a biologist with the Game and Fish Division who was the regional supervisor at that time.

The advice consisted of the application of scientific wildlife management techniques to enhance wildlife values on the area and would include the annual harvest of surplus animals in a legal and controlled public hunt each year. It was also suggested that the Berry forest be managed by the Game and Fish Division in the same manner as other Wildlife Management Areas over the state. Such an arrangement, it was felt, would provide better control and protection for the wildlife in the Berry forest.

The Berry administration, feeling that a controlled legal hunt and full-time patrol by a Game and Fish Refuge Manager would help solve the increasing problems of poaching and better protect the wildlife populations, agreed to the arrangement. For the safety of the students and to minimize conflicts during the hunts, a "No Hunting" safety zone and wildlife refuge was established adjacent to the campus. Managed hunting is allowed only on the outer portions of the tract.

The entire area is approximately

25,000 acres in size. The refuge area consists of 12,000 acres and the wildlife management area where the hunts are held covers about 13,000 acres. The area is mostly forest land consisting of an oak, hickory and pine mixture, with pine being dominant in the timber management areas. The terrain is the typical ridge and valley land form of northwest Georgia and there are two mountains on the area. Rock Mountain (in the hunting area) is unusual in that it has steep sides and a flat plateau on top. Lavender Mountain is a long ridge and its crest forms one of the boundaries between the hunting area and the refuge.

As mentioned earlier, the area has an excellent deer population although the harvests have been low for the past two seasons due to inclement weather during the hunts. The area also has a fair small game population, with squirrel being the most numerous species in a forest habitat such as Berry provides. Frank Early of Mt. Berry, Georgia, is the area manager and he feels that the area is a big success. "Most of the people who come to hunt here are local residents. They are good, honest sportsmen for the most part, and they seem really appreciative of this hunting area located close by their homes," says Early.

Berry College officials are also pleased with the area, feeling that they are filling three important needs by adopting this course of action: "We are enhancing the environment by specifically managing and protecting the wildlife on the area, and we have better protection and control of our forest. We also feel that we are meeting our community obligations by providing an opportunity for public hunting and are sharing our resources with the people of the area."

# Sinking of the Tampa

By Tina Carlson

Photos by Bob Busby

She went down with all the grace and integrity that was — and still is — rightfully hers. The Tampa, a ghost-like tugboat from the long-gone days of 1890's, serenely retired to the underwater world on Saturday, July 14, 1973. There she will become an artificial reef, after having seen the best of this life.



We set out on the "Wahoo" at 7:30 Friday morning to pay the Tampa our last respects, but it being Friday the 13th, naturally everything fell through. The 14-hour towing job from Savannah to Brunswick was delayed by rough seas, so we tried again 4:30 Saturday morning. We rode out to the site 23 miles offshore from Brunswick with Larry Smith, supervisor of the artificial reef project, and Jack Evans, one of his assistants. The rest of his crew, Mike Younce and Tom Burchman, spent a restless night with the tug anchored in the Savannah River.

The sunrise was incredibly beautiful as we watched Larry's crew and men from the Atlantic Towing Company (who donated and towed the Tampa from Savannah to Brunswick) position and anchor the tug. As the men opened the valves in the bottom of the ship and blew holes in its sides, the ocean rushed into the vacant engine room. And so began the sinking of the Tampa.

Three years ago, the Game and Fish Division of the Georgia Department of Natural Resources began building artificial reefs in the offshore waters of the state. These reefs provide habitat for fish where once there was only a bare sand bottom. By sinking scrap materials such as automobile tires and surplus naval vessels from 8 to 25 miles offshore, the Division hopes to enable small boat fishermen to harvest reef and bottom type fish without having to go 40 to 80 miles out to sea. Tired of catching trout and channel bass? Here's your chance to try your luck at red snapper, black sea bass, trigger fish, grouper and sheephead.

The project first started by sinking units of automobile tires. These units are composed of a column of eight tires connected by steel rods in the middle and concrete in the bottom. There presently are three tire reefs consisting of 25,000 tires each off Georgia's coast: 9 miles off Wassaw Sound in Savannah, 8 miles off St. Simons Island, and 13½ miles off Cumberland. Not only has the sport fishing been great at these sites, but the scuba diving is fantastic.

Contracts have recently been signed to add 25,000 more tires to the Wassaw reef and to put 25,000 tires down at the site 23 miles offshore of Brunswick where the tugboat was sunk. While automobile tires have been found to be functional as reef material, they are expensive. The





Division is now testing a new idea of using truck tires bound together by nylon bands. With this type of material, there would be nothing in the system that could degrade in the marine environment. Surplus railroad cars and concrete rubble are also being considered as reef material. A federal bill recently passed makes surplus liberty ships available to individual states for marine life conservation. Georgia has asked for two of these ships, which will be obtained from the James River Reserve fleet in Norfolk, Virginia. All superstructure and petroleum deposits will be removed, then one ship will be sunk off Savannah and one off Brunswick.

Sound like an awful lot of clutter on the ocean floor? It's not. All this scrap material will, in fact, provide habitat for fish much like that found at the outer edges of the continental shelf. With time, as the reef materials settle, they will become encrusted with invertebrate life and eventually build a shelf in which the fishes can live.

The Brunswick structure, which will be about one-half mile long and 300 yards wide, will form a composite reef; that is, the reef will be composed of different elements which will merge together to form a whole. The tugboat and liberty ship will provide the mass which will actually change current patterns and provide eddies and upwellings which will attract the fish. The railroad boxcars will provide protective habitat for fish, and the tires will furnish niches for individual fish and their food organisms. This composite structure may ultimately form a biologically sound and long-lasting estuarine community.

The Division hopes these artificial reefs will stimulate the establishment of charter and head boat fishery, besides providing excellent sport fishing and scuba diving. The charter boats would specialize in trolling for Spanish and king mackerel, sailfish, and marlin in the Savannah and Brunswick areas. Head boats, with a capacity of twenty to forty people a day at a rate of approximately \$10.00 to \$15.00 per person, would specialize in bottom fishing.

The Division hopes to build at least five or six artificial reefs off the Georgia coast, but plans thorough research on the reefs currently existing or under construction before building more. Such research will determine the best lo-

cations, sizes, types of materials, construction techniques, and depth for a given species of fish. "The main question to be answered," said project supervisor Smith, "is whether we are concentrating fish for harvest and depleting offshore areas, or whether we are creating habitat to increase the carrying capacity of the oceans." Data for research will be obtained by divers going down to the reefs about once a month to observe crustacean material and inventory the fish population on the reef. Divers also will trap and tag fish to determine residence or migratory habits.

These reefs are being built with a combination of general state funds and support from federal agencies, or matching money. Most of the matching money has come from the Coastal Plains Regional Commission. In the three years that the project has been in existence, the Game and Fish Division has spent approximately \$155,000 in state funds on artificial reefs.

It didn't take long for the Tampa to actually sink. The stern went down first, slowly and with resolve. She rocked to the left, but then straightened herself as if she realized that this was to be her last performance above the sea. We were silent, almost sad to see such a powerful ship so peacefully die. But when all that was left was the tip of the bow, we became excited at the thought of the new life that the Tampa would bring to the world below us. Now she is resting 75 feet below the surface of the ocean with steel buoys marking her location, and already she has become a new home for an amazing variety of underwater creatures.





A lovely pastoral scene, right? Wrang. This is Coahulla Creek, a terribly polluted tributary of the Canasauga. Pollution Control Specialist Dave Knight checks the stream's flow, while Ken Martin measures its dissolved oxygen.

# A Quality of Water?

By T. Craig Martin

Photos by the Author

Of more than 1,800 Department of Natural Resources employees, perhaps only 300 or so ever come to the public's attention. The Conservation Rangers are highly visible, as are department officials and information officers who do a lot of public speaking, and occasionally a biologist or engineer will become known for his work on a particular project. But there remain hundreds upon hundreds of DNR workers whose

tasks are little known and less understood; in a series of articles over the next several months, **OUTDOORS IN GEORGIA** will present a sampling of these important, if little known, DNR employees.

A field day in the life of a Pollution Control Specialist from the Environmental Protection Division begins early and ends late. Take, for example, the day a three-man team from the

Knight examines the flow meter that enables him to check the water speed. By measuring this speed at several points across the stream, the monitors can compute the volume of water that flows past this point.



Division's Water Quality Surveys Service recently spent examining the highly polluted Conasauga River in northwest Georgia. They left their Atlanta offices before daylight, worked through the day collecting and testing water samples from the Conasauga and its tributaries, and finally returned in the late dusk.

About three days a week are consumed this way, for the Service's monitoring unit must check some 50 stations scattered throughout the state each month. Nearly 170 stations exist on some 52 streams, but most are monitored by members of other state or federal agencies.

The work is physically demanding, techni-

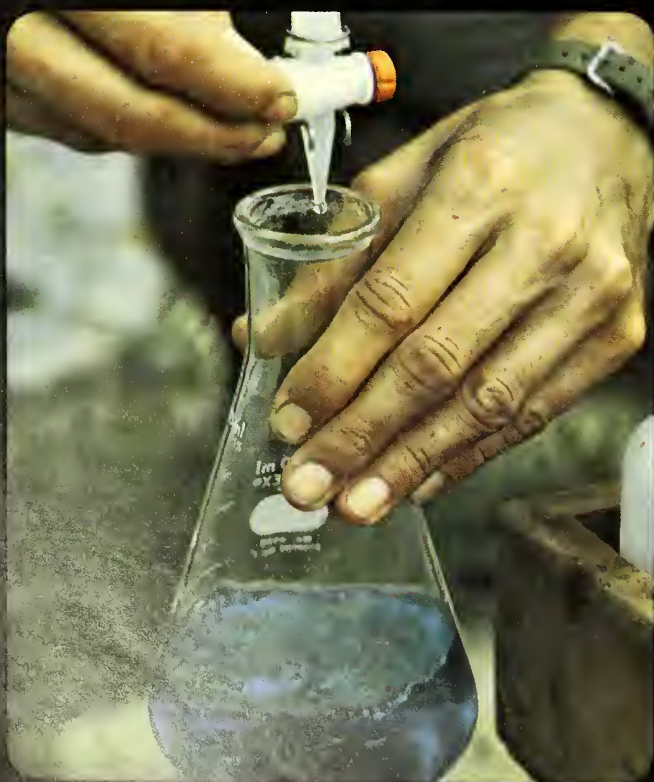
cally rigorous and, to an outsider at least, relatively tedious. At each check point, samples are collected (some to be tested on the spot, others to be returned for laboratory analysis) and the stream's flow is checked. The routine is precise and efficient, for any variation in procedure could invalidate the results.

Field tests determine, among other things, the amount of dissolved oxygen in the stream and the level of demand placed on that oxygen. Simply put, the stream obtains oxygen from the air as it flows along, and from microscopic plants that grow suspended in the water. The stream remains in good shape as long as the

Careful records must be kept if the data is to be accurate and useful for prediction.



The dissolved oxygen test takes a good deal of pouring and mixing and shaking, as well as a keen eye to judge when the liquid in the bottle (below) becomes perfectly clear. Here Bob Arnsdorf runs through the procedure.



demand placed upon that supply by organic materials (which must be purified by oxygen) does not exceed the stream's capacity to produce and replace the vital oxygen.

The variables involved here are more than a little complex, but two important factors checked by the monitoring team are the volume and flow rate of the stream. More water means that pollutants become diluted more quickly, and any given amount of pollution makes less inroads on a large stream than on a small one. Fast streams generally replace oxygen more quickly than sluggish ones, since they splash and tumble in the air more. Temperature also is important, for cold water can hold more oxygen than warm water.

These variables, of course, suggest why monitoring must be done throughout the year. Stream levels rise and fall, flow rates change, and temperature varies with the season. So the monitoring crew takes to the field in every month.

Field testing is only part of the job however;



Knight examines the outflow from Dalton's waste treatment plant. The treated water splashes against a barrier to add needed oxygen before it enters this stream, which flows into the Conasauga.

One of the reasons the Conasauga is in trouble: dyes from Dalton's carpet mills flow untreated into this stream, and from here into the Conasauga.

water samples are brought back for extensive laboratory analysis in Atlanta. There, much more complicated procedures are used to check the type and amount of suspended solids, and the nature and volume of bacteria in the water.

All the data collected in field and laboratory must be organized in some meaningful way, and the monitoring team takes care of that. They analyze and interpret the material, then pass it on to others in the Division to serve as the basis for decision making.

One use of this information is in compiling computer models of the streams. This will allow the Surveys Service's field engineering unit to predict the effect of pollution that enters a stream. This information will help municipal and industrial planners in developing waste treatment facilities.

Hot work in summer, cold work in winter; but work that must go on if Georgia's streams are to survive man's onslaught. One of many relatively invisible chores carried out by Department of Natural Resources employees.



# SCOUTING FOR DEER



Photo by Leonard Lee Rue III

By Bob Wilson

So you're determined to bag a deer this year, perhaps even two? A few half-hearted hunts in seasons past, together with today's meat prices, have finally made you get serious about hunting deer. By now you have your hunting license, your big game license, and your 500 square inches of fluorescent orange material in the form of an outer garment. You should have checked your weapon on the range to make sure of sight zero, waxed or oiled your boots, honed your knife to a keen edge, and checked the condition of all your other equipment—especially your tree stand if you use one. You should even have your hunt-

ing areas picked out—one of the Wildlife Management Areas, a general portion of national forest land, some timber company land, or a farm whose owner has given permission.

But how will you know *exactly* where to hunt? On which side of what ridge is there likely to be a trophy buck or nice fat doe? Where will you have a good field of view and be able to see the deer before they sense you? The only way to tell is by scouting. Oh, a friend can put you on a stand that proves to be a good one, or you may blunder upon a good spot by chance, but successful deer hunters, those who regularly put venison in the

freezer, often spend as much time scouting as actually hunting.

Learning to read signs and spending a few hours in the woods before the day of the hunt will increase your chance of success dramatically. Even if you should still spend a day on your stand without a glimpse of a deer, you will *know* that deer have been in the area in the past day or two and that your spot was as good as any in the area. You may also have the pleasure of putting a friend on a stand that helps him bag his deer.

Good deer habitat, providing forested and open areas with suitable foods, can be found in every part of

the state. But, just how do you know that a particular stand should be a productive one, or stalking through a specific area could be worthwhile? Simple. You look for sign. If you know how to read the various signs you can get a pretty good idea of the number of deer using an area, size and sex of the deer, and how recently they were in the area.

### Tracks

Tracks are the most obvious sign, and can be very useful. Tracks quickly reveal the general size, rate of travel, direction of travel, and often the time span between the time they were made and the time they were discovered. Tracks may be scattered in an apparently random wandering fashion or clumped together on a trail or around a "salt lick."

Obviously, the size of a track is related to the size of the deer that made it, but there is more to it than that. Big bucks often drag their feet, leaving faint lines for an inch or two in front of the track. Marks of dewclaws, hoof-like appendages above the rear of the hoof, are usually more prominent in tracks made by bucks than in those made by does.

Aging tracks with any degree of accuracy calls for vast experience, but a careful examination of the track should let even a novice put it in a "fresh," "half-day-old," "yesterday," or "old" category. A fresh track in soft earth will be crisp, with sharp edges; the bottom will be firm and clear of loose debris. Depending on its location and the weather conditions a track will dry in an hour or two. Within six hours the crisp and sharp edges will have become rounded, and individual grains of dirt will have fallen into the depressed areas of the track. More time, a night's dew and perhaps a gentle morning breeze, will give the track a rounded, soft appearance, almost as if the deer's hoof had been made of potter's clay. A good hunting area should contain old tracks as well as new ones; and a variety of track sizes, with a few large ones, should indicate a good mixed herd with some bucks.

Where tracks are concerned, the most common mistake made by hunters is attempting to hunt a deer by following apparently fresh tracks. I'll have to admit this method might be

*Fresh tracks are proof positive that deer have been in the area recently. A mixture of recent and old tracks indicate regular use by deer. A collection of tracks such as this around a natural salt lick is seldom encountered.*



Photos by Bob Wilson



*Where deer trails cross fallen timber the deer's hooves cause damage such as this. Such sign may be difficult to age, but it should be fairly easy to tell whether the sign was made this year or last.*



*The condition of browse is a good indication of the density of the deer population. This honeysuckle shows intensive browsing in August of this year.*

possible, but more than nine times out of ten, you'll never see the deer. And the time you do, you'll catch a quick glimpse of that famous white tail just before it's gone: deer are simply too aware of their back trail to be crept up on this way.

### Trails

Assuming you have found tracks of varying degrees of freshness where you want to hunt, the next step is to look for trails and patterns of movement. Trails vary according to type of use, and the number of deer using them. Trails can be so old and heavily used that they actually are worn into the ground like a rut, or they can be so new and lightly used that they are very hard to discern.

Don't assume that an old, heavily used trail is the only place to hunt. Wise old bucks may use a trail of their own some 20 to 60 feet to one side of the main trail. You may have heard of bucks "slipping up on" hunters from behind; and in many of these cases, the hunter was simply watching the main trail and was between it and the buck's trail, or worse yet, on the buck's trail.

In some areas, Clark Hill WMA is a good example, you'll find trails wandering literally everywhere, and no apparent main trail. This is a feeding or browse area through which the deer wander, nibbling on whatever happens to appeal to them. Such trails may lead from thickets at higher elevations to a watering area, but in a very erratic, leisurely fashion.

Make certain a trail has fresh tracks on it before picking a stand. If there is a lot of forest debris on the trail, which makes locating a track difficult, look at logs lying across the trail—they should show fresh evidence of being clipped by deer's hooves.

### Browse

Browse, or food that deer should be eating, will also help you pick a spot to hunt. Deer have definite favorites, and when such yummys as honeysuckle and sumac or white oak acorns are plentiful, they will eat the item of choice and ignore the rest of the menu. If you are not familiar with the types of food deer like, take a look at the article, "Find the Food—Find the Deer," by Winston A. Andrews in last month's issue of *Outdoors in Georgia*.

In areas with a lot of deer, a browse line may be visible on favored species, with the choice morsels ripped off from ground level to as high as the deer can reach. Check the branch tips of dogwood, honeysuckle, plum, black locust, and other favored deer foods closely to see if the very ends have been clipped off. After the acorns fall, look under oaks for large patches of disturbed leaves.

### Droppings

Deer droppings or scat is another good indicator of the number of deer in a given area and confirms recent, as well as old, use by deer. Common sense should enable anyone to roughly age droppings, but a close look is nec-

essary if there is moisture on the ground.

### Rubs and Scratches

Rubs and scratches are signs of bucks. Rubs are bare spots on small trees and bushes where the bucks have rubbed the velvet off their antlers. Scratches or scrapes are areas where bucks have scraped off the forest litter and raked and trampled the soft earth. The exact significance of scratch areas is unknown, but a cleared area on the forest floor that has been trampled is a sure sign of a buck.

Trees and bushes selected by bucks for rubs usually are quite small—three to four inches in diameter—and springy. A rub might appear on only

Photo by Leonard Lee Rue III



one side of a single tree, or four or five bushes or trees may have their bark completely shredded. The extent of a rub does not seem to be related to the size of a buck's rack.

You might indeed be able to bag a deer this season without the benefit of pre-hunt scouting, but you can easily tip the odds in your favor by spending a few hours in the woods looking around. Knowing what to look for is half the struggle; thinking about what you see and knowing what it means is the other half. Learning to look and appreciating the meaning of small signs in the woods is at least half of hunting; success is perhaps the smaller half.

# Book Review

GUN DIGEST TREASURY, 4th Edition, John T. Amber, Ed., Digest Books, Inc., 352 pages, \$5.95.

This particular Digest tome is billed in a cover blurb as "the best from 25 years of GUN DIGEST," and in this case, you can judge a book by its cover. While 25 years worth of material from GUN DIGEST certainly gave Amber a vast amount of material to select from, the selections, as best this reader can judge, are excellent. Whatever you find of interest in the annual edition, with the exception of the product listings, you will find in excellence in GUN DIGEST TREASURY.

One of the most valuable items contained in this volume is a 27-year index (1944-1973), listing by author and subject all articles in the first 27 editions of GUN DIGEST and the first six issues of HANDLOADER'S DIGEST. Just where you are going to be able to locate that 1952 edition which contains the article on the Hauck falling-block action, Amber doesn't say.

Of particular excellence among the articles is "Reloading Sans Cartridge Cases," by Robert E. Corby. This es-

say on black powder shooting is far more helpful than anything in the BLACK POWDER GUN DIGEST.

Whatever you find to interest you in this GUN DIGEST TREASURY, you may rest assured that the article will be a good one. If you usually find a couple of articles of interest in the annual GUN DIGEST, the GUN DIGEST TREASURY well deserves your reading.

—BW

DEER HUNTING by Norman Strung, Lippincott, 239 pages, \$7.95.

It seems that every season brings another book on deer hunting. Some stress certain aspects of the subject while others attempt to cover the whole topic. Some attempt to study the hunting of only one type of deer, or concern themselves with only one region. Norman Strung has chosen to cover "the whole thing" in one gulp, which, in this reader's opinion, is unfortunate.

A rather lengthy chapter (the longest in the book) on deer management begins the book. The layman and beginning deer hunter will learn enough from this chapter alone to warrant reading the book. However, anyone looking for detailed specifics on the management of deer herds in the southeast will have to go elsewhere.

Subsequent chapters deal respectively with the Whitetail and Mule Deer. These sections contain good, if somewhat general discussions of the habitat requirements, habits, activities and hunting tactics for these animals. The use of tree stands is described as a tactic for hunting whitetail, and not even considered in the chapter on mule deer. Yet on a hunt in Colorado last month, Garth Fuller, a Georgia whitetail hunter, got a nice muley from a tree stand in what western hunters call thick timber. While the tactics Strung suggests for hunting either type of deer are good solid approaches, we found Georgia piney-woods whitetail tactics to be very effective on mule deer (60% hunter success, bowhunting).

It may be this reader's personal point of philosophy that brings dis-

agreement with Strung's statements in a chapter on "Skills, Savvy and Equipment." Strung would have the hunter begin trailing a shot deer at once, and, "If after an hour or so of searching, you find neither sign nor animal, you are safe to assume that the deer wasn't wounded that badly and has given you the slip." This might be construed by the novice to mean that one should give up after following a faint blood trail for an hour, or spending an hour looking for sign leading from the site of a hit. Frequently, no blood trail will be found within 25 yards of a hit, and in an area cluttered with tracks, a beginner could spend his whole allotted hour cutting circles within a 20-yard radius of his last sighting of the animal. It may also take the allotted hour to follow a faint trail a quarter of a mile. It is probable that Strung meant *sign* when he said sign, as an hour's search around the spot of the last sign or sighting is certainly none too much.

In the same chapter, Strung has sound advice on shot placement, the reading of tracks, and equipment. Details on measuring racks under the Boone and Crockett Club system are a handy addition in the view of those *Outdoors in Georgia* staffers who get involved in the annual Georgia Big Deer Contest sponsored by *Outdoors in Georgia* and the Georgia Wildlife Federation. This reviewer happens to agree with Strung in his choice of both rifles and hunting knives (.270 for open areas, and .30-06 for all around effectiveness; and a short wide-bladed knife with a drop point), which may be neither here nor there, but Strung gives specific reasons for the preferences. The author also has some sound advice on sharpening knives and axes.

In regard to bowhunting, the reviewer again disagrees with some of the author's statements, but the differences are those of personal feeling and preference rather than points of substance. And here again, the author has made many other statements with which the reviewer is in complete accord. For example: "The popular consensus is heavy on accuracy at long ranges — 40 yards and beyond. But speaking from personal experi-

ence, I have gotten most of my shots well under that range: 20 to 25 yards is about average, so I feel being able to place arrows in an 8-inch circle at that distance is an able beginning." *En accord!* Provided, of course, that practice is carried out at various ranges out to 25 accurate, measured yards.

The final chapter, on "Carcass Care," is simply excellent. Strung tells, and shows by clear illustrations, how you can easily butcher your deer. The author also includes several recipes, which are just about worth the price of the book alone. Concluding with a number of uses for what are all too often considered by-products of a successful hunt, "Horns, Hooves, and Hides," Strung wraps up his book covering the hunting of deer in North America in admirable fashion.

Out of the yearly crop, probably only one or two books out of five on the subject are worth reading (assuming that you have already read one and been deer hunting twice). *DEER HUNTING* by Norman Strung is worth reading — just don't expect much specific advice on Georgia pincy-woods hunting. If you are well read on the subject of deer management, and are a fairly experienced deer hunter, you will not find much new, but the few tid-bits that you do come across are well worth the effort, and we all can periodically stand a bit of review.

—BW

**DICTIONARY OF SHARKS**, by Patricia Pope, Great Outdoors Publishing Co., 88 pages, \$1.95 (paper-bound).

Whoever said "you can't tell a book by its cover" knew what he was talking about. While the cover of *DICTIONARY OF SHARKS* decidedly resembles a coloring book, the inside reveals a surprising amount of information. A guide to the identifying characteristics, size, color, and range of over 125 species of sharks, the text is well illustrated and researched.

Shark fishing, while a rather unproclaimed sport, is explored in detail in the book. Aspects such as cost

and equipment, techniques and methods of shark fishing are covered. Fillet of shark? It may not be as strange as it sounds. The next time you think you are eating swordfish or cod from your local grocery store, you may actually be eating shark. Many countries consider shark a delicacy, and Patricia Pope provides some quite interesting recipes in her book.

*DICTIONARY OF SHARKS* explains how sharks find food without the help of sight, sound, or scent. It outlines various experiments which show what types of stimulus provoke the shark's hunting activity and at what range. An excellent section entitled "The Shark As An Aggressor" examines some of the species of sharks which are considered dangerous and exposes different theories on what prompts a shark to attack. Also in this section are methods of discouraging the aggressive shark.

This book certainly will not alienate the reader by being too technical or scientific; it is written on an almost elementary level. Nonetheless, *DICTIONARY OF SHARKS* claims to be a book for the layman, and it is.

—Tina Carlson

## Outdoor World

### DANGEROUS LEVELS OF MERCURY FOUND IN RAILS

High mercury residues may be found in some rails (marsh hens) shot in the Brunswick area of the Turtle River-Brunswick River reach north of the Sidney Lanier Bridge making the birds unsafe for human consumption. Several years ago high levels of mercury were found in crabs and fish in the same area.

"About a year ago we became aware of the high mercury residues found in rails (marsh hens) taken by hunters in the Brunswick area," Jack Crockford, Director of the Game and

Fish Division of the Department of Natural Resources said. "In cooperation with the Environmental Protection Division we did sampling studies on rails (marsh hens) and found that high mercury residues apparently are limited to birds taken in the Turtle River-Brunswick area, north of the Sidney Lanier Bridge."

R. S. "Rock" Howard, Director of the Environmental Protection Division of the Department, said "the high mercury residues found in the samplings of some rails shot in the Brunswick area last year were definitely above what is considered safe for human consumption. The U.S. Food and Drug Administration has specified that foods containing in excess of 0.5 mg/1 (or parts per million) are unsafe for human consumption. Some rails (marsh hens) tested in the reach north of the Sidney Lanier Bridge contained mercury levels as high as 11 mg/1 (or parts per million)."

Crockford suggested that hunters of the rails (marsh hens) do their hunting in other coastal areas.

—Karen H. Stroud

### STORING AND PROCESSING YOUR DEER

It is an unfortunate circumstance of nature that most lucky deer hunters bag their quarry at unusual hours and often many miles from home. The successful hunter is immediately faced with the chores of field dressing the carcass; lugging it back to his car and getting the skin off the deer. Now he must set out to find a facility to further render his awkward burden into edible portions of steaks, chops, roasts, etc.

The next recommended step is aging the carcass in a meat cooler at 32-35 degrees for around a week, and then having it butchered to specifications. Unless our hunter is a butcher himself and/or has access to a meat cooler, he must find assistance to complete the process. All this time the hunter is working against the time limit imposed by meat spoilage which can cheat him out of his hard-won venison.

In most cases, the hunter must rely on a commercial meat processing facility for the equipment and advice

necessary to best prepare his meat. There he can find out how long his animal should be aged and secure the services of professional meat cutters who will butcher the carcass with minimum waste. Since these facilities process commercial meat, they must stay within the standards imposed by governmental inspection agencies regarding the storage and processing of wild meat.

Federal regulations apply in those plants inspected by USDA:

**Storage** — carcass should be covered with plastic or some other protective material but the hide need not be removed. The carcass should be reasonably clean and free of dried blood, parasites, and trash.

**Processing** — the carcass cannot be processed at the same time as commercial (inspected) meat.

State regulations are in effect at those plants inspected by the State Department of Agriculture Meat Inspection Division:

**Storage** — the carcass should be reasonably clean and hung out of contact with other carcasses and identified.

**Processing** — the carcass can not be processed at the same time as commercial (inspected) meat or with the same equipment unless the equipment is cleaned after processing wild meat. Meat should be packaged and labeled "For Home Use." This is done on a custom basis under the same requirements as those for farm slaughtered domestic animals.

Meat markets and butchers are regulated by the Consumer Protection Division, State Department of Agriculture:

The carcass must be fully dressed when brought in and equipment must be cleaned after processing. This is done on a custom basis and meat is stamped "For Home Use."

All wild meat is processed at any facility at the operator's discretion, and does cause considerable trouble. Don't be surprised if the cost is rather high and some operators refuse to handle wild meat at all. The best bet is to locate one processor who has several other deer on hand

and can economically run the whole lot at once. Always remember the processor is doing you a favor when he handles your venison.

—Aaron Pass

## GEORGIA CHAPTER OF WILDLIFE SOCIETY FORMED

Amid the current proliferation of conservation/environmental groups, the formation of yet another one might not seem especially newsworthy except in a case of special interest or merit. Such is exactly the case of the recently formed Georgia Chapter of The Wildlife Society which was organized at Brunswick in late August. The field of interest, the type of membership, and the national affiliation of this group makes it unique among the currently active conservation groups and clubs in the state.

The main interest area of the Wildlife Society Chapter is naturally enough, wildlife, an interest which is fed and fostered by a membership consisting of professional wildlife managers. Members of the Chapter include representatives of such agencies as: The Department of Natural Resources, Game and Fish Division, U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Army, University of Georgia, and the University of Georgia Extension Service. The Georgia Chapter will be chartered by The Wildlife Society, an international professional association specializing in wildlife conservation, management, and enhancement.

The fledgling Georgia Chapter met at Brunswick Junior College to elect officers, establish standing committees and to discuss Chapter goals. The officers are: Bob Ernst (Game & Fish), President; Duff Holbrook (U.S. Forest Service), President-elect; John Oberheu (Fish & Wildlife Service), Secretary; Joe Kurz (Game & Fish), Treasurer; and Board members, Ron Simpson (Game & Fish) and Dr. Larry Marchington (U.Ga.). Committees include: Program, Public Relations, Non-game, Game, and Environmental issues.

Besides the standing objectives of The Wildlife Society to promote sound stewardship of, prevent man-induced damage to, and to increase awareness

and appreciation of our wildlife resources, the Georgia Chapter has adopted several goals of its own. According to President Ernst, "We feel the most important roles of this Chapter to be providing a base of inter-agency support on environmental matters and to promote knowledgeable professional management of the wildlife resource. We also plan to identify, professionally examine and officially comment on current environmental issues and provide a fund of knowledge available to other conservation groups on wildlife matters."

The meeting at Brunswick included a one day field trip to Sapelo Island to observe activities on the R. J. Reynolds Wildlife Refuge.

—Aaron Pass

## FOREST FIRMS LIST CONTACTS FOR HUNTING PERMISSION

Finding land on which he can obtain permission to hunt is perhaps the major problem facing today's sportsman. Permission to hunt on private lands is difficult to obtain, but perhaps even more difficult is finding the owner of the land to ask permission.

Many of the forest industries in Georgia have vast acreages of land which they allow hunters to use if permission is requested. In fact, more than three million acres of industry-owned land are open in Georgia each year, by permission.

The Georgia Department of Natural Resources, as a public service, has provided a list of forest industries to aid sportsmen in obtaining permission to hunt. The list was compiled in cooperation with the Southern Forest Institute, an association of wood-using industries in the Southeast. Hunters are urged to respect the owners' property and to abide by any company rules.

The Department, in publishing this list, does not guarantee that hunting privileges will be granted by any companies or on any lands. The list is provided to inform hunters who they should contact to request permission to hunt on the lands owned by the various companies. The Department also reminds hunters that they must have the permission of any landowner,

including forest industries, before hunting.

No information is available from the Department as to the location of any lands of any of the companies. Maps of these lands are available from some of the companies.

Contacts of the various companies to request information and hunting privileges are:

Georgia Kraft Co., Wood and Woodlands Division, P.O. 1551, Rome, Ga. 30161; also district managers, W. J. Rowston, P.O. Box 103, Coosa, Ga. 30129; T. A. Gresham, P.O. Box 272, Gainesville, Ga. 30501; Paul L. Lawrence, Rt. 6, Box 287, Macon, Ga. 31201; J. H. Colson, 625 West Taylor St., Griffin, Ga. 30223; and W. G. Carson, Oconee Development Forest, Greensboro, Ga. 30642.

Container Corporation of America, Paper Mill Division, North Eight St., Fernandina Beach, Fla. 32034; also Ed Mathews, Area Forester, Container Corp. of America, Waycross Area Headquarters, Box 887, Waycross, Ga. 31501; Walt Branyan, Area Forester, Container Corp. of America, McRae Area Headquarters, P.O. Box 237, McRae, Ga. 31055; Ed Pope, Area Forester, Container Corp. of America, Cusseta Area Headquarters, P.O. Box 58, Richland, Ga. 31825.

Gilman Paper Co., St. Mary's Kraft Division, St. Marys, Ga. 31558; also, J. G. Fendig, Manager, Timber Division, Gilman Paper Co., St. Mary's Kraft Division, St. Marys, Ga. 31558.

International Paper Co., Georgetown, S.C. 29440; also Harold M. Phillips, Area Superintendent, P.O. Box A, Richmond Hill, Ga. 31324; David Warren, Forest Wildlife Specialist for the Panama City Region, P.O. Box 2487, Panama City, Fla. 32401.

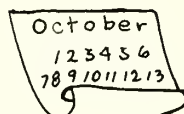
ITT Rayonier Inc., P.O. Box 528, Jesup, Ga. 31545; also, Thomas E. Evans, Area Supervisor, ITT Rayonier, Inc., Eastman, Ga. 31023; Luke H. Morgan, Area Supervisor, Supervisor, ITT Rayonier, Inc., Swainsboro, Ga.; Marvin F. Williams, Area Supervisor, ITT Rayonier, Inc., Waycross, Ga. 31501; W. J. Menear, Jr., Area Supervisor, ITT Rayonier, Inc., Swainsboro, Ga.; Slen C. Campbell, Area Supervisor, ITT Rayonier, Inc., Jesup, Ga. 31545.

Union Camp Corp., George Gehrken, Woodlands Division, P.O. Box 570, Savannah, Ga. 31402.

Brunswick Pulp and Paper Co., H. Glenroy Dowdy, Land Manager, Brunswick, Ga. 31521.

Great Northern Paper Co., Mr. Anderson, Timberlands Manager, P.O. Box 44, Cedar Springs, Ga. 31732.

# Outdoor Calendar



## HUNTING SEASONS

**Deer Archery** — The open season for hunting deer with bow and arrow in Game Zones I, Ia, II, III, IV and V, shall be from September 29 through October 27, 1973, in any county, or part thereof, having a legal firearms deer season. Bag limit is two (2) bucks or one (1) buck and one (1) doe. Hunting with dogs prohibited except in such areas and during such times as it may be legal under firearms hunting regulations.

The open season for hunting deer with bow and arrow in Game Zone VI shall be from September 29 through October 19, 1973, in any county, or part thereof having a legal firearms deer season. Bag limit is two (2) bucks or one (1) buck and one (1) doe. Hunting with dogs prohibited.

Notice: Archery equipment may be used during firearms hunts, however, all hunters must abide by firearms regulations as to bag limits.

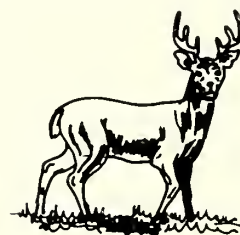
## Deer Firearms Seasons

**GAME ZONE V:** October 20, 1973 through January 1, 1974 in the following counties: Clinch County, except that portion lying in the southwest corner of the County, bordered on the north by the Seaboard Coastline Railroad and on the east by Suwannee Creek, and except that portion lying north of Arabia Bay

Wildlife Area and between U.S. Highway 221 and U.S. Highway 441, which exceptions are closed: Echols County east of U.S. Highway 129 and south of Georgia Highway 187; and Lanier County north of the Seaboard Coastline Railroad and east of the Alapaha River and southeast of U.S. Highway 221. Bag limit two (2) bucks. Hunting with dogs allowed.

October 20 through November 17, 1973 in Ware County, except that portion lying north of U.S. 82 and those portions lying within the outermost boundaries of Waycross State Forest WMA, which are closed to deer hunting. Bag limit two (2) bucks. Hunting with dogs allowed.

**GAME ZONE VI:** October 20, 1973 through January 1, 1974. All counties in Game Zone VI will be open with the following exceptions: that portion of Charlton County lying northwest of the Okefenokee Swamp, which is closed; that portion of Pierce County lying west of U.S. #82 and Pleasant Hill Church Road; that portion of Pierce County lying in the northeast corner bounded on the west by U.S. #82 and on the south by Ga. #32, and that portion of Pierce County lying in the southeast corner bounded on the east by Ga. #15 and on the west by U.S. #82, which are closed; that portion of Wayne County



lying west of Jesup which is bounded on the north by Ga. #169 and on the south by U.S. #82, which is closed. Bag limit two (2) bucks. Hunting with dogs allowed.

The marshes and islands lying east of the Intercoastal Waterway in Bryan, Camden, Chatham, Liberty and McIntosh Counties will be open for the taking of deer of either sex on October 20 through January 1, 1974. Bag limit two (2) bucks or one (1) buck and one (1) doe. Hunting with dogs allowed; however, Sapelo and Blackbeard Is-

lands are closed to all hunting except as otherwise specifically provided.

**Fox** — There shall be no closed season on the taking of fox.

It shall be unlawful for any person to take or attempt to take any fox, within the State, by use or aid of recorded calls or sounds or recorded or electronically amplified imitations of calls or sounds.

**Grouse** — October 13, 1973 through February 28, 1974. Bag limit three (3) daily; possession limit six (6).

**Wild hogs**—Hogs are considered non-game animals in Georgia. They are legally the property of the land owner, and cannot be hunted without his permission, except on public lands. Firearms are limited to shotguns with Number 4 shot or smaller, .22 rimfire rifles, centerfire rifles with bore diameter .257 or smaller, the .30 cal. Army Carbine, the .32/20, all caliber pistols, muzzle loading firearms and bows and arrows.

**Opossum**—October 13, 1973 through February 28, 1974 in Carroll, Fulton, DeKalb, Gwinnett, Barrow, Jackson, Madison, Elbert and all counties north of those listed. No bag limit. Night hunting allowed. All counties south of the above named counties are open year round for the taking of possum. No bag limit. Night hunting allowed.

**Raccoon**—October 13, 1973 through February 28, 1974 in Carroll, Fulton, DeKalb, Gwinnett, Barrow, Jackson, Madison, Elbert and all counties north of those listed. Bag limit one (1) per night per person. Night hunting allowed. All counties south of the above named counties are open year round for the taking of raccoon. No bag limit. Night hunting allowed.

**Rail (Marsh Hens)**: September 10 through November 18. King and clapper rail daily bag limit 15, possession limit 30, singly or in aggregate. Virginia and sora rail daily bag limit 25, possession limit 25, singly or in ag-

gregate. Legal shooting hours will be 30 minutes before sunrise until sunset.

**Dove**: Georgia has been divided into two zones for the coming dove season by a line formed by U.S. 80 from Columbus to Macon, Ga. 49 from Macon to Milledgeville, Ga. 22 from Milledgeville to Sparta, Ga. 16 from Sparta to Warrenton, U.S. 278 from Warrenton to Augusta.

Northern Zone: September 8 through October 27, and December 15 through January 3.

Southern Zone: September 29 through October 27, and December 6 through January 15.

Daily bag limit 12, possession limit 24. Legal shooting hours will be from 12 noon until sunset.

**Ducks**: December 6 through January 19. Daily bag limit 5, possession limit 10. Daily bag may not include more than 1 black duck with 2 in possession and 2 wood ducks with 4 in possession. Season is closed on canvasback and redhead ducks, brant and geese. Legal shooting hours will be 30 minutes before sunrise until sunset.

**Extra Scaup Limit**: In addition to the scaup which may be taken in the regular duck season daily bag, an extra 2 scaup daily with 4 in possession will be allowed on the east (seaward) side of the Intracoastal Waterway in Chatham, Bryan, Liberty, McIntosh, Glynn and Camden counties.

**Coots**: December 6 through January 19. Daily bag limit 15, possession limit 30. Legal shooting hours will be 30 minutes before sunrise until sunset.

**Gallinules**: November 12 through January 19. Daily bag limit 15, possession limit 30. Legal shooting hours will be 30 minutes before sunrise until sunset.

**Mergansers**: December 6 through January 19. Daily bag limit 5, possession limit 10. Not more than 1 daily and 2 in possession may be hooded mergansers. Legal shooting hours will be 30 minutes before sunrise until sunset. In addition to the required State licenses, each person, 16 years of age or older, who hunts waterfowl must possess a **valid** Federal Migratory Bird Hunting Stamp, available from most U.S. Post Offices.

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